

**IN THE CLAIMS:**

Page 30, before Claim 1, delete the following heading:

**CLAIMS**

Page 30, before Claim 1, insert the following new heading:

**WHAT IS CLAIMED IS:**

Please amend claims 1-57 and add new claims 58-68 as follows:

1. (Currently Amended) An optical transmission system comprising at least a first and a second terminal station, optically connected with each other by an optical link, said first or said second terminal station being adapted to send on said optical link at least a first optical signal having a first direction, said system further comprising:
  - [[ - ]] a first supervisory unit associated to a device disposed along said optical link, said first supervisory unit being adapted for generating a first supervisory signal, said first supervisory unit being further associated to at least one modulator being adapted to superimpose on said first optical signal said first supervisory signal; and  
~~characterized in that said system further comprises:~~
  - [[ - ]] at least one pump source disposed along said optical link, said pump source being adapted to send on said optical link a pump radiation in a second direction opposite to said first direction, so as

to cause Raman amplification of said first optical signal and of said first supervisory signal superimposed on said first optical signal.

2. (Currently Amended) ~~An~~ The optical transmission system according to claim 1, ~~characterized in that~~ wherein said first supervisory signal comprises at least an information signal on an operating state of said device.
3. (Currently Amended) ~~An~~ The optical transmission system according to claim 1, ~~or 2, characterized in that~~ wherein said device disposed along said optical link is a repeater and said at least one pump source is comprised in said repeater.
4. (Currently Amended) ~~An~~ The optical transmission system according to claim 3, ~~characterized in that~~ wherein said first supervisory unit is associated to said pump source.
5. (Currently Amended) ~~An~~ The optical transmission system according to ~~any one of the preceding claims, characterized in that~~ claim 1, wherein said modulator is a lithium niobate modulator.
6. (Currently Amended) ~~An~~ The optical transmission system according to ~~any one of claims 1 to 4, characterized in that~~ claim 1, wherein said modulator is a semiconductor modulator.
7. (Currently Amended) ~~An~~ The optical transmission system according to ~~any one of claims 1 to 4, characterized in that~~ claim 1, wherein said modulator is a tunable band-pass filter.
8. (Currently Amended) ~~An~~ The optical transmission system according to ~~any one of claims 1 to 4, characterized in that~~ claim 1, wherein said modulator is a variable optical attenuator.

9. (Currently Amended) ~~An~~ The optical transmission system according to claim 8, characterized in that wherein said variable optical attenuator is a magneto-optical variable attenuator.
10. (Currently Amended) ~~An~~ The optical transmission system according to ~~any one~~ of claims 1 to 4, characterized in that claim 1, wherein said modulator comprises an optical amplifier, and ~~in that~~ said first supervisory signal is adapted to modulate a gain of said optical amplifier.
11. (Currently Amended) ~~An~~ The optical transmission system according to claim 10, characterized in that wherein said optical amplifier is an erbium-doped fiber amplifier.
12. (Currently Amended) ~~An~~ The optical transmission system according to claim 11, characterized in that wherein said erbium-doped erbium-doped fiber amplifier comprises at least one erbium-doped fiber and at least a further pump source adapted for emission of a pumping radiation for said erbium doped fiber, said first supervisory unit being associated to said further pump source, so that said first supervisory signal is adapted to modulate said pumping radiation for said erbium-doped fiber.
13. (Currently Amended) ~~An~~ The optical transmission system according to claim 10, characterized in that wherein said optical amplifier is a semiconductor amplifier.
14. (Currently Amended) ~~An~~ The optical transmission system according to claim 10, characterized in that wherein said optical amplifier is a co-propagating Raman amplifier.

15. (Currently Amended) ~~An~~ The optical transmission system according to claim 14, ~~characterized in that~~ wherein said co-propagating Raman amplifier comprises at least a further pump source being adapted to send on said optical link a pumping radiation in said first direction, so as to cause Raman amplification of said first optical signal, said first supervisory unit being associated to said further pump source, so that said first supervisory signal is adapted to modulate said pumping radiation for Raman amplification.
16. (Currently Amended) ~~An~~ The optical transmission system according to ~~any one of the preceding claims, characterized in that~~ claim 1, wherein said device further comprises at least one photodetector~~[[,]]~~ being adapted to receive at least a portion of said first optical signal and transform said portion of said first optical signal ~~in~~ into an electrical signal.
17. (Currently Amended) ~~An~~ The optical transmission system according to claim 16, ~~characterized in that~~ wherein said first supervisory unit is associated to said photodetector and is adapted to discriminate a secondary supervisory signal carried by said first optical signal.
18. (Currently Amended) ~~An~~ The optical transmission system according to claim 17, ~~characterized in that~~ wherein said first supervisory unit is adapted to feed the discriminated second supervisory signal to said at least one modulator.
19. (Currently Amended) ~~An~~ The optical transmission system according to ~~any one of the preceding claims, characterized in that~~ claim 1, wherein said optical link comprises at least a first optical fiber and a second optical fiber, said first optical fiber being adapted to carry said first optical signal in said first direction and said

second optical fiber ~~being~~ adapted to carry a second optical signal in said second direction.

20. (Currently Amended) ~~An~~ The optical transmission system according to claim 19, ~~characterized in that~~ wherein said device comprises at least a second Raman pump source, said second Raman pump source being adapted to send on said second optical fiber a pump radiation in said first direction, opposite to the direction of said second optical signal, so as to cause Raman amplification of said second optical signal.
21. (Currently Amended) ~~An~~ The optical transmission system according to claim 19, ~~or 20, characterized in that~~ wherein said device comprises at least a second modulator, said second modulator being associated to said first supervisory unit.
22. (Currently Amended) ~~An~~ The optical transmission system according to claim 21, ~~characterized in that~~ wherein said first supervisory unit is adapted for generating at least a third supervisory signal, and said second modulator is adapted for superimposing said third supervisory signal to said second optical signal.
23. (Currently Amended) ~~An~~ The optical transmission system according to ~~any one of claims 19 to 22, characterized in that~~ claim 19, wherein said device further comprises at least a second photodetector, ~~being~~ adapted to receive at least a portion of said second optical signal and transform said portion of said second optical signal in an electrical signal.
24. (Currently Amended) ~~An~~ The optical transmission system according to claim 23, ~~characterized in that~~ wherein said first supervisory unit is associated to said

second photodetector and is adapted to discriminate a fourth supervisory signal carried by said second optical signal.

25. (Currently Amended) ~~An~~ The optical transmission system according to ~~any one of the preceding claims, characterized in that~~ claim 22, wherein said first or said second terminal station comprises a second supervisory unit, being adapted to receive at least a portion of said first or said second optical signal from said optical link and discriminate from said first or said second optical signal said first or said third supervisory signal.
26. (Currently Amended) ~~An~~ The optical transmission system according to claim 25, ~~characterized in that~~ wherein said second supervisory unit is adapted to generate a fifth supervisory signal to be superimposed on said first or said second optical signal.
27. (Currently Amended) ~~An~~ The optical transmission system according to ~~any one of the preceding claims, characterized in that~~ claim 26, wherein said first or said second optical signal is a WDM optical signal.
28. (Currently Amended) ~~An~~ The optical transmission system according to claim 27, ~~characterized in that~~ wherein said first or said second terminal station comprises a plurality of transmitters being adapted to emit a respective plurality of optical signals having different wavelengths, and a multiplexing device being adapted to multiplex said plurality of optical signal signals having different wavelengths in said WDM optical signal.

29. (Currently Amended) ~~An~~ The optical transmission system according to claim 28, ~~characterized in that~~ wherein said first or said second terminal station comprises a transmitter optical amplifier.
30. (Currently Amended) ~~An~~ The optical transmission system according to claim 26- and 29, ~~characterized in that~~ wherein said second supervisory unit is associated to said transmitter optical amplifier, so that said fifth supervisory signal is adapted to modulate a gain of said transmitter optical amplifier.
31. (Currently Amended) ~~An~~ The optical transmission system according to claim 30, ~~characterized in that~~ wherein said transmitter optical amplifier is a co-propagating Raman amplifier.
32. (Currently Amended) ~~An~~ The optical transmission system according to ~~any one~~ of claims 26 to 29, ~~characterized in that~~ claim 26, wherein said first or said second terminal station comprises at least a third modulator, said second supervisory unit being associated to said third modulator in order to superimpose said fifth supervisory signal to said first or said second optical signal.
33. (Currently Amended) ~~An~~ The optical transmission system according to claim 32, ~~characterized in that~~ wherein said third modulator is a variable optical attenuator.
34. (Currently Amended) ~~An~~ The optical transmission system according to claim 33, ~~characterized in that~~ wherein said third modulator is a magneto-optical variable attenuator.
35. (Currently Amended) An optical repeater comprising at least a first optical fiber adapted to carry a first optical signal in a first direction, at least a first modulator connected to said first optical fiber and a supervisory unit associated to said first

modulator, said supervisory unit being adapted to generate a first supervisory signal, said first modulator being adapted to superimpose said first supervisory signal on said first optical signal, ~~characterized in that said optical repeater further comprises~~ at least a first pump source connected to said first optical fiber, said first pump source being adapted to send on said first optical fiber a pump radiation in a second direction opposite to said first direction, said pump radiation being adapted to cause Raman amplification of said first optical signal on said first optical fiber.

36. (Currently Amended) ~~An~~ The optical repeater according to claim 35, ~~characterized in that~~ wherein said supervisory unit is associated to said first pump source.
37. (Currently Amended) ~~An~~ The optical repeater according to claim 35, ~~or 36,~~ ~~characterized in that it further comprises~~ comprising a second optical fiber adapted to carry a second optical signal in a second direction opposite to said first direction and at least a second modulator connected to said second optical fiber.
38. (Currently Amended) ~~An~~ The optical repeater, according to claim 37, ~~characterized in that~~ wherein said supervisory unit is associated to said second modulator and said second modulator is adapted to superimpose said first supervisory signal on said second optical signal.
39. (Currently Amended) ~~An~~ The optical repeater according to ~~any one of claims 37 or 38,~~ ~~characterized in that it~~ claim 37, ~~further comprises~~ comprising at least a second pump source connected to said second optical fiber, said second pump



source being adapted to send on said second optical fiber a pump radiation in a direction opposite to said second direction, said pump radiation being adapted to cause Raman amplification of said second optical signal.

40. (Currently Amended) ~~An~~ The optical repeater according to claim 39, characterized in that wherein said supervisory unit is associated to said second pump source.
41. (Currently Amended) ~~An~~ The optical repeater according to ~~any one of claims 35 to 40, characterized in that~~ claim 39, wherein said first supervisory signal comprises at least an information signal on the operating state of said first or said second pump source.
42. (Currently Amended) ~~An~~ The optical repeater according to ~~any one of claims 35 to 41, characterized in that it~~ claim 35, further comprises comprising a first photodetector connected to said first optical fiber, said first photodetector being adapted to receive at least a portion of said first optical signal and transform said portion of first optical signal ~~in~~ into an electrical signal.
43. (Currently Amended) ~~An~~ The optical repeater according to claim 42, characterized in that wherein said supervisory unit is associated to said first photodetector, so as to discriminate a second supervisory signal carried by said first optical signal.
44. (Currently Amended) ~~An~~ The optical repeater according to ~~any one of claims 37 to 43, characterized in that it~~ claim 37, further comprises comprising a second photodetector connected to said second optical fiber, said second photodetector

being adapted to receive at least a portion of said second optical signal and transform said portion of second optical signal ~~in~~ into an electrical signal.

45. (Currently Amended) ~~An~~ The optical repeater according to claim 44, ~~characterized in that~~ wherein said supervisory unit is associated to said second photodetector, so as to discriminate a third supervisory signal carried by said second optical signal.
46. (Currently Amended) ~~An~~ The optical repeater according to ~~any one of claims 35 to 45,~~ claim 35, ~~wherein~~ said first ~~or said second~~ modulator is a lithium niobate modulator.
47. (Currently Amended) ~~An~~ The optical repeater according to ~~any one of claims 35 to 45,~~ claim 35, ~~wherein~~ said first ~~or said second~~ modulator is a semiconductor modulator.
48. (Currently Amended) ~~An~~ The optical repeater according to ~~any one of claims 35 to 45,~~ claim 35, ~~wherein~~ said first ~~or said second~~ modulator is a tunable band-pass filter.
49. (Currently Amended) ~~An~~ The optical repeater according to ~~any one of claims 35 to 45,~~ claim 35, ~~wherein~~ said first ~~or said second~~ modulator is a variable optical attenuator.
50. (Currently Amended) ~~An~~ The optical repeater according to claim 49, ~~characterized in that~~ wherein said variable optical attenuator is a magneto-optical variable attenuator.
51. (Currently Amended) ~~An~~ The optical repeater according to ~~any one of claims 35 to 45,~~ claim 35, ~~wherein~~ said first ~~or said second~~ modulator

comprises an optical amplifier, and ~~in that~~ said first supervisory signal is adapted to modulate a gain of said optical amplifier.

52. (Currently Amended) ~~An~~ The optical repeater according to claim 51, ~~characterized in that~~ wherein said optical amplifier is an erbium-doped fiber amplifier.
53. (Currently Amended) ~~An~~ The optical repeater according to claim 52, ~~characterized in that~~ wherein said ~~erbium-doped~~ erbium-doped fiber amplifier comprises at least one erbium-doped fiber and at least a further pump source adapted for emission of a pumping radiation for said ~~erbium-doped~~ erbium-doped fiber, said supervisory unit being associated to said further pump source, so that said first supervisory signal is adapted to modulate said pumping radiation for said erbium-doped fiber.
54. (Currently Amended) ~~An~~ The optical repeater according to claim 51, ~~characterized in that~~ wherein said optical amplifier is a semiconductor amplifier.
55. (Currently Amended) ~~An~~ The optical repeater according to claim 51, ~~characterized in that~~ wherein said optical amplifier is a co-propagating Raman amplifier.
56. (Currently Amended) ~~An~~ The optical repeater according to claim 55, ~~characterized in that~~ wherein said co-propagating Raman amplifier comprises at least a further pump source ~~being~~ adapted to send on said first optical fiber a pumping radiation in said first direction or on said second optical fiber a pumping radiation in said second direction, said pumping radiation being adapted to cause Raman amplification of said first or of said second optical signal, said supervisory

unit being associated to said further pump source, so that said first supervisory signal is adapted to modulate said pumping radiation for Raman amplification.

57. (Currently Amended) A method for supervising an optical transmission system comprising an optical link between at least a first and a second terminal station, said method comprising:

[[ - ]] transmitting a first optical signal on said optical link in a first direction;

[[ - ]] superimposing a first supervisory signal on said first optical signal;  
and

~~characterized in that said method further comprises:~~

[[ - ]] sending on said optical link a pump radiation in a second direction opposite to said first direction, so as to cause Raman amplification of said first optical signal and of said first supervisory signal superimposed on said first optical signal.

58. (New) The optical repeater according to claim 37, wherein said second modulator is a lithium niobate modulator.
59. (New) The optical repeater according to claim 37, wherein said second modulator is a semiconductor modulator.
60. (New) The optical repeater according to claim 37, wherein said second modulator is a tunable band-pass filter.
61. (New) The optical repeater according to claim 37, wherein said second modulator is a variable optical attenuator.

- 62. (New) The optical repeater according to claim 61, wherein said variable optical attenuator is a magneto-optical variable attenuator.
- 63. (New) The optical repeater according to claim 37, wherein said second modulator comprises an optical amplifier, and said first supervisory signal is adapted to modulate a gain of said optical amplifier.
- 64. (New) The optical repeater according to claim 63, wherein said optical amplifier is an erbium-doped fiber amplifier.
- 65. (New) The optical repeater according to claim 64, wherein said erbium-doped fiber amplifier comprises at least one erbium-doped fiber and at least a further pump source adapted for emission of a pumping radiation for said erbium-doped fiber, said supervisory unit being associated to said further pump source, so that said supervisory signal is adapted to modulate said pumping radiation for said erbium-doped fiber.
- 66. (New) The optical repeater according to claim 63, wherein said optical amplifier is a semiconductor amplifier.
- 67. (New) The optical repeater according to claim 63, wherein said optical amplifier is a co-propagating Raman amplifier.
- 68. (New) The optical repeater according to claim 67, wherein said co-propagating Raman amplifier comprises at least a further pump source adapted to send on said first optical fiber a pumping radiation in said first direction or on said second optical fiber a pumping radiation in said second direction, said pumping radiation being adapted to cause Raman amplification of said first or of said second optical signal, said supervisory unit being associated to said further pump source, so